
Biocytogen Launches RenNano® Mouse, a Fully Human Heavy Chain Antibody Platform to Accelerate Nanobody Drug Discovery

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Biocytogen Pharmaceuticals (Beijing) Co., Ltd. today officially launched its fully human heavy chain antibody platform, RenNano®. RenNano® is the third member of the RenMice™ family, joining RenMab™ and RenLite®. Together, Biocytogen's three RenMice™ platforms allow for the streamlined discovery and development of fully human monoclonal antibodies, bispecific/multispecific antibodies and single-domain antibodies (sdAbs, or nanobodies).

While humans and mice generate antibodies that require heavy and light chain pairing to be functional, camels and sharks generate heavy-chain-only antibodies (HCAb), meaning their variable domains (VHH or sdAb) can function without pairing with the light chain. Owing to their nanometer-level size and small molecular weight, sdAbs have superior permeability, and thus can cross the blood-brain barrier and infiltrate solid tumor tissues. In addition, the longer CDR3 region enables sdAbs to detect the otherwise hidden epitopes of GPCRs and other challenging targets. Since sdAbs have a simple structure, they are ideal building blocks for assembling bispecific/multispecific antibodies and CAR cell therapies.



Figure 1. Biocytogen's RenMice™ family consists of RenMab™, RenLite® and RenNano®

While nanobodies have its unique advantages, animals that naturally produce HCABs, such as camels, are difficult to be widely used for the preparation of monoclonal antibodies because they are large, having a long breeding cycle and generate few offspring. Meanwhile, humanization is required to develop camelid antibody sequences into drugs, which further increases the complexity and time of drug development.

To overcome these challenges, Biocytogen engineered the RenNano® mouse by modifying the constant region of the fully human RenMab™ model to allow for HCAb production. Compared with other existing HCAb platforms, the in situ replacement of the mouse genes with the complete human heavy chain variable genes makes the RenNano® mouse one of the most comprehensive fully human antibody platforms in the world. SdAb sequences generated from RenNano® mice have the highest possible diversity, and do not require antibody humanization, which saves time and cost, and reduces risk of failure during later stages of drug development. Additionally, compared with camelids or other natural HCAb-producing species, mice are easier to breed and immunize. Immunization of RenNano® mice can generate HCABs with diverse CDR3 sequences that recognize a variety of epitopes. These HCABs can recognize antigens with nM-level affinity independent of light chains. Moreover, antibodies derived from RenNano® mice are capable of exerting biological functions both in vitro and in vivo. They are highly hydrophilic and have favorable developability characteristics.

The successful development of the RenNano® platform expands Biocytogen's capabilities for antibody discovery and broadens the applications of our antibody library. We welcome global partners to realize the full potential of our RenMice™ platforms and derive antibodies to generate novel therapeutics.

Read the [original article](#) on Biocytogen Pharmaceuticals.